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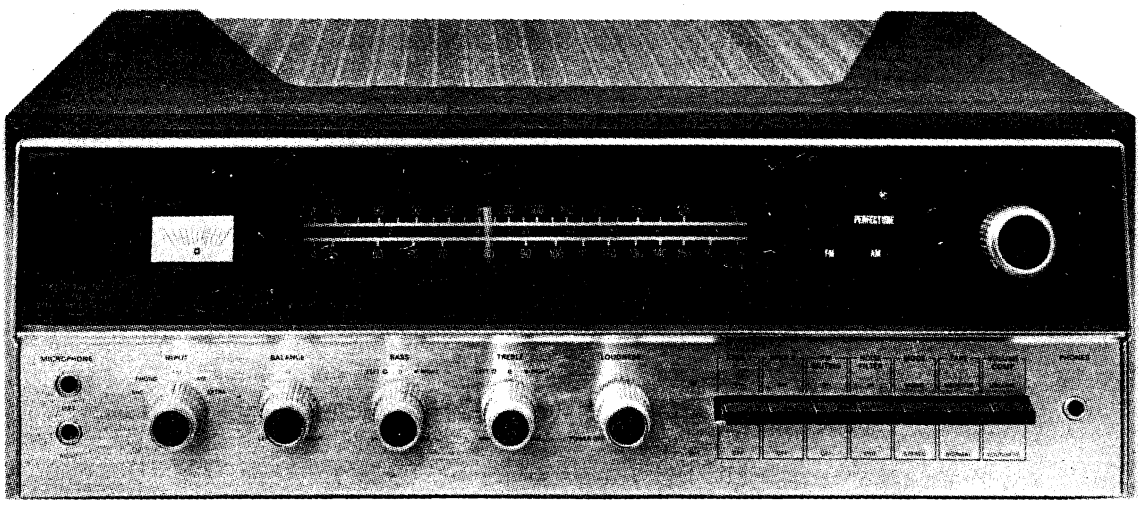
PRICE 1.00

SERVICE MANUAL FOR 386 RECEIVER



Scott . . . where innovation is a tradition

SCOTT

H. H. Scott, Inc. 111 Powdermill Road, Maynard, Mass., 01754

Form 029-1175-023

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SPECIFICATIONS

Tuning Range	88-108 MHz
Usable Sensitivity (IHF)(30 dB S/N)	2.5 UV
Signal to Noise Ratio	65 dB below 100% mod.
Total Harmonic Distortion	0.6%
Frequency Response (FCC limit)	30 15000 Hz + 1 dB
Capture Ratio	3 dB
Selectivity (400 kHz off channel)	35 dB
Dial Calibration Accuracy	0.5%
AM Suppression	55 dB
19 kHz output (ref + 75 kHz dev. @ 400 Hz)	40 dB
38 kHz output (ref + 75 kHz dev. @ 400 Hz)	70 dB
Separation @ 400 Hz	35 dB
Cross Modulation Rejection	80 dB
FM Muting Switching level (adjustable)	3 - 30 uV
IM Distortion	0.4%

Audio Section

Input Sensitivity	Phono	high 3 mV
		low 6 mV
	Mic	10 mv
	Extra	0.45V
	Tape in	0.45V

Hum & Noise

Below Rated Output	Phono	65 dB
	Mic	70 dB
	Extra	75 dB
	Tape in	75 dB

Input Impedance

Phono	50 K ohm
Mic	50 K ohm
Extra	50 K ohm (25 K in Mono)
Tape in	50 K ohm (25 K in Mono)

Frequency response @ 1W		15-30 kHz ± 1 dB
Power Bandwidth (IHF)		
3 dB below clipping		(.8% THD) 10-25000 Hz
THD at max output (both channels)		1 KHz less than 0.4%
IMD at Max output (both channels)		less than 0.5%
Damping Factor		20
Separation @ 1 KHz		50 dB min.
Power output cont. Watts		
(rms) both ch.	8 ohm	68 W
	4 ohm	78 W
	16 ohm	42 W
Music Power IHF	8 ohm	84 W
	4 ohm	137 W
	16 ohm	48 W
Single Channel (rms)	8 ohm	36 W
	4 ohm	54 W
	16 ohm	22.5 W

Additional Data

Line Voltage & Frequency	105 - 125 VAC/50-60 Hz (110/220 Conversion Model 100-120/190-235V)
Receiver Power Consumption	25 W idling, 150W max
Transistor Diode complement	26 transistors, 28 diodes, 7 IC's

AM Section

Tuning Range	535 KHz to 1620 KHz
Bandwidth	(-3 dB) 8 KHz
	(-6 dB) 10 KHz
Selectivity	32 dB
THD (60% modulation)	2.0%
Usable Sensitivity	100 uV/m @ 600 KHz
Hum & Noise	40 dB below 100% modulation
Spurious Response Rejection	>60 dB
IF Rejection	>33 dB
Image Rejection	>48 dB

Audio Oscillator

THD less than	0.5%
Frequency range	20 - 110000 Hz
Output voltage	0 - 10 V rms (600 ohms)

DC Voltmeter

Range	1.5 V - 150 V dc
Input impedance	more than 1 MΩ

AC Voltmeter

Range	3 mV - 30 V rms full scale

Harmonic Distortion Analyzer

Range 1% full scale THD
Input sensitivity 1 V rms or better
Frequency range 20 - 20000 Hz

Oscilloscope

Vertical Bandwidth 10 Hz - 500 kHz ∓ 3dB
Sensitivity 0.2 V/cm or better

Volt – Ohm Meter (multimeter)

DC 20 KΩ/V
AC 5 KΩ/V

FM RF Signal Generator

Range 88 - 108 MHz
Maximum Deviation ∓ 150 KHz
Provision for external modulation
THD less than 0.5% at ∓ 75 KHz deviation @ 400 Hz

FM Multiplex Generator

Minimum 40 db separation
Must have sufficient output to modulate RF generator

Resistive Dummy Loads

Two 8Ω 35W min loads

Audio Attenuator

1 dB step form 0 - 100 dB
(not required if audio oscillator has attenuator built in)

Variac (3A) or regulated 117V line source

AM GENERATOR
400 Hz modulation (0 - 100%)
output: 1 μV - 1V
range: 500 KHz - 30 MHz

Set Controls to Following Positions for Test Procedure

Front Panel

Input selector	Extra
Tone controls	Flat (12 o'clock)
Loudness Power	AC off
Balance	12 o'clock
⇌1 Speaker	On } *
Loudness/Vol	Vol }

*All other buttons should be in "out" position

Rear Panel

Preamp sensitivity Max (up position)
Balance L-R Switch must be in NORMAL position.

1. Bias and Balance Adjustments (no speaker connected)

(a) Preset bias adjustment pots for zero bias (arrows pointing toward front of unit)

(b) Turn unit ON, leave volume control at minimum; check supply voltage and regulator voltages. On power supply regulator measure following points:

–		+	
(6)	to	(4)	+ 33V ∓ 10%
(3)	to	(1)	+ 33V ∓ 10%
(12)	to	(10)	+ 13V ∓ 10%
(9)	to	(7)	+ 13V ∓ 20%

(c) Measure voltage across MAIN speaker terminal on 3V scale; reading should be less than 0.5V. Do *not* continue if voltage is larger than indicated.

(d) Set VOM to 12 mA DC and connect leads to left MAIN speaker terminal. Adjust DC offset potentiometer on left driver module (R) for zero reading.

(e) Repeat for right channel.

(f) Set VOM to 12 mA DC scale and touch cases of *left* lower and upper output transistors (1111 – 008 and 1111 – 009) with negative and positive probe respectively. Be careful not to short the case to chassis! Adjust left driver amplifier module bias potentiometer for 1.2 mA reading cold or 1.6 mA after unit has warmed up for a few minutes.

(g) Repeat on right upper and lower transistors for right channel.

2. Audio Level Tests (Tone Control plus driver and output stage)

(a) Turn input selector to EXTRA, connect audio oscillator to left EXTRA input on rear panel. Set oscillator frequency to 1 kHz.

(b) Connect 8Ω resistive loads to left and right speaker output terminals; connect AC voltmeter across left 8Ω load (30 V range).

(c) Turn volume control fully clockwise and observe wave form on scope; adjust output of oscillator until wave form is just below clipping; output voltage should be approximately 15 V rms. (–4½ dB on 30 V scale) Input must be –5 ± 1 dB on 1 V scale. (0.45 V)

(d) Observe wave form carefully and check for oscillations; a small notch appearing when amplifier is driven into hard clipping is caused by the bootstrap circuit and is normal.

(e) Repeat for right channel.

3. Frequency Response Check

(a) Check that all controls are set as described on page 2.

(b) Feed a 1 kHz audio signal into left EXTRA input and set volume control at about 11 o'clock. Adjust generator output to give a 0 dB reading on the 3 V scale. 3 dB down points should occur between 10 and 20 Hz and between 25 and 40 kHz.

4. Tone Control Response

	Bass 100 Hz	Treble 10 kHz
Boost	12 dB ± 2 dB	12 dB ± 2 dB
Cut	12 dB ± 2 dB	15 dB ± 2 dB

5. Distortion Check

(a) Set tone controls to flat position and turn volume fully clockwise.

(b) Set audio oscillator to 10 kHz and adjust output level so that wave form is just below clipping point.

(c) THD must be below 0.6%.

6. Damping Factor Check

(a) Feed 1 kHz audio signal into TAPE IN, press tape monitor button and adjust generator or volume control for 0 dB on 3 V scale. When 8 ohm load is removed output voltage must not change more than 1 dB. Release TAPE MONITOR button.

(b) Short CCT Test: Push MODE Switch to MONO Position and adjust oscillator so that output is just clipping. Place a short circuit across both speaker terminals; circuit breaker should open. Remove short and reset breaker and check for normal operation. If unit has speaker fuses this test can be omitted when spare fuses are available.

7. Noise Filter

(a) Feed 10 kHz audio signal into EXTRA.

(b) Adjust generator or volume for 0 dB reading on 3 V scale across 8 ohm load.

(c) Push NOISE FILTER button and observe 9 dB ± 1 dB decrease in signal level.

(d) Release NOISE FILTER button.

8. Loudness-Volume Check

(a) Feed 1 kHz into EXTRA: push Vol-Comp. button in (VOL)

(b) Set generator for −10 dB on 3 V scale across 8 ohm load; volume control at 9 o'clock.

(c) Release VOLUME COMP button and note 5 dB ± 2 dB increase.

(d) Push button in again (VOL) and set oscillator to 100 Hz.

(e) Release VOLUME COMP button and note 11 dB ± 2 dB increase.

(f) Repeat procedure at 10 kHz and observe increase of 5 dB ± 1½ dB.

(g) Check volume control tracking in 10 dB steps to 40 dB down. Output must not vary more than 3 dB between channels.

9. #1 and #2 Speaker Switches Check

Check operation of #1 and #2 speaker switches by connecting 8 ohm loads or speakers to each and selecting the appropriate button. Headphone output is not affected by speaker buttons.

10. Crosstalk, Stereo Switch and Balance Control Check

With volume control at maximum, audio generator feeding into EXTRA 2 *left* input, increase generator output for 15 V rms into 8 ohm load. Connect VTVM across *right* channel 8 ohm load; signal level should be at least 45 dB down. Select MONO and note increase in signal level. Output of left and right channels should be within 1 dB of each other.

Rotate Balance Control to maximum counterclockwise position and observe a minimum drop of 50 dB; repeat similar test for other channel. Release button to STEREO position.

11. Phono and Mic Preamp Gain Checks

(a) Select PHONO on selector switch; reduce audio oscillator to approximately 3 mV output and feed a 1 kHz signal into left phono input; volume control is set fully clockwise. Adjust oscillator output until output at speaker terminals is just below clipping (16 V rms approx). Input level must be −8 ± 2 dB on .01 V scale.

(b) Set preamp sensitivity switch to "LOW" and note a 6 dB ± 1 dB drop in output level; return switch to "high" position.

(c) To check Mic gain make proper connections and select MIC position on selector switch. Adjust input so that output at speaker terminals is just below clipping. Input signal level must be −6 dB ± 2 dB on .01 V scale.

(d) Set preamp switch to "LOW" and note a 5½ dB ± 1 dB reduction in output signal. Return sensitivity switch to "HIGH" position.

(e) Repeat above steps for right channel.

Nominal Over-All Gain @ 1 kHz

	At Speaker	At Tape Out
Phono (hi-sens)	73½ dB	43 dB
Phono (low-sens)	67½ dB	37 dB
Mic (hi-sens)	71½ dB	41 dB
Mic (low-lens)	66 dB	35½ dB
EXT	30½ dB	0 dB

12. Phono (RIAA) and Mic Response Checks

(a) Release speaker pushbuttons and connect AC VTVM to left TAPE OUT jack.

(b) Selector switch to PHONO position.

(c) Set oscillator to 1 kHz and adjust its output to obtain a 0 dB reading on 0.3 V scale of AC VTVM.

(d) Check that the following readings are within ± 2 dB of those given in table.

(e) To check Mic response, repeat steps c and d after making the proper connections.

Frequency	Phono (R1AA)	MIC
1 kHz	0 dB	0 dB
100 kHz	+ 13 dB	0 dB
10 kHz	− 13 3/4 dB	0 dB

(f) Repeat response checks for right channel.

13. Hum and Noise Check

(a) Set volume fully clockwise; tone controls to flat position. Short both phono and Mic inputs.

(b) Push speaker switch and measure hum and noise across 8 Ω load resistors.

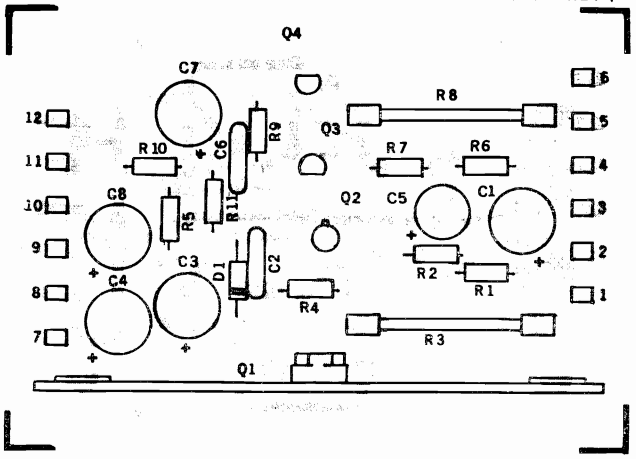
Position	Unweighted Noise (Max)
Phono	20 mV
Mic	15 mV
Ext	8 mV

14. Balance L-R Check

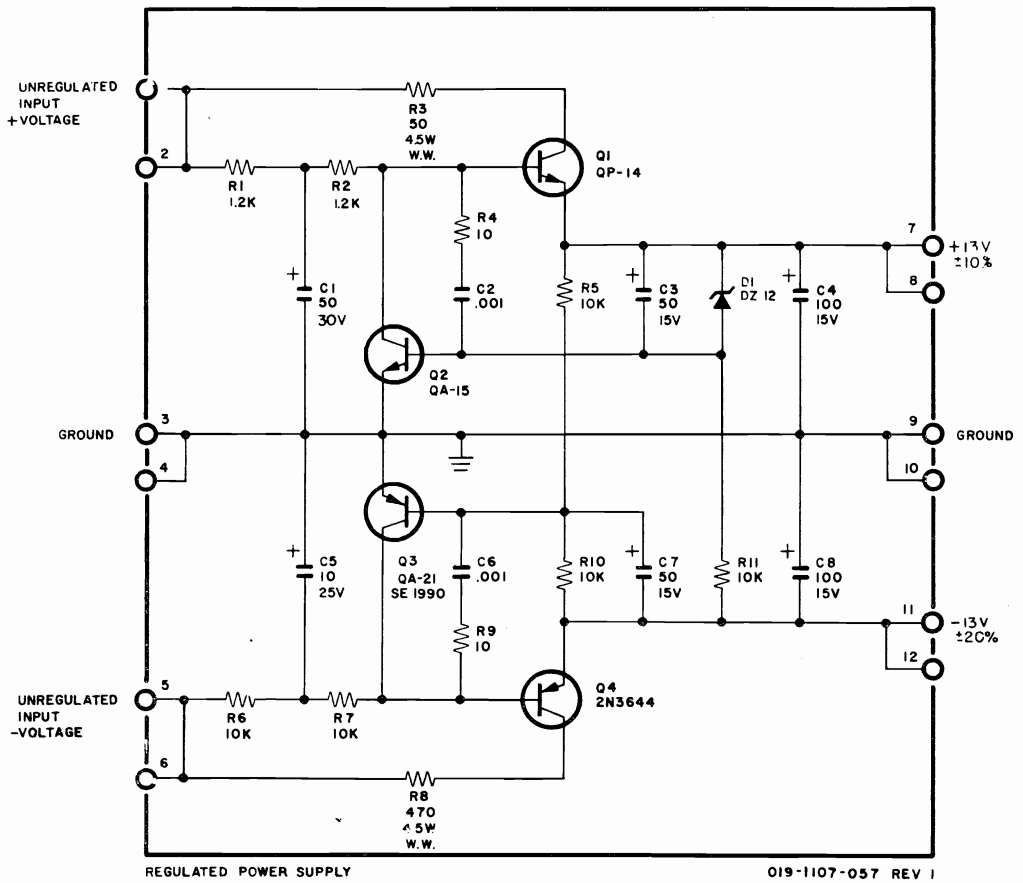
To check the operation of the BALANCE L-R switch, feed a signal into both left and right inputs (Ext or Tape-In) and move switch into L (left) position. Both input signals should appear at the left speaker output only. Selecting R both signals must appear on the right speaker output. Set switch to NORMAL.

Q1 QP 14
Q2 QA 15
Q3 S 1990
Q4 S 2209

CIRCUIT DIAGRAM 100-1340-012 REV I



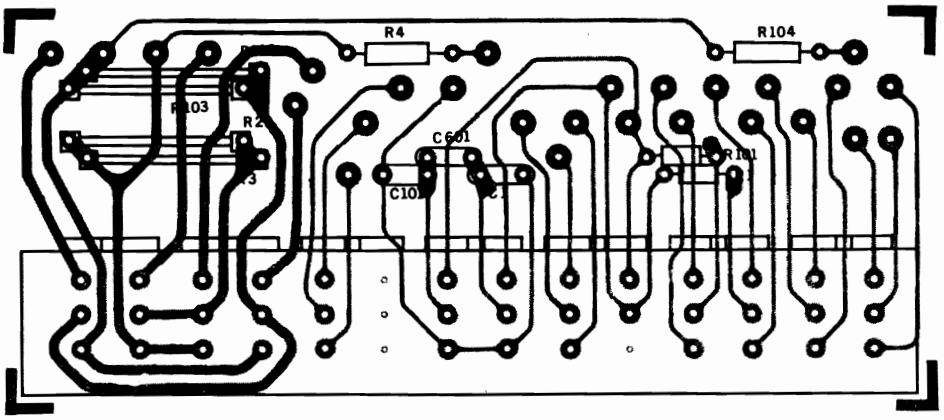
POWER SUPPLY **019-1107-057 Rev. I**



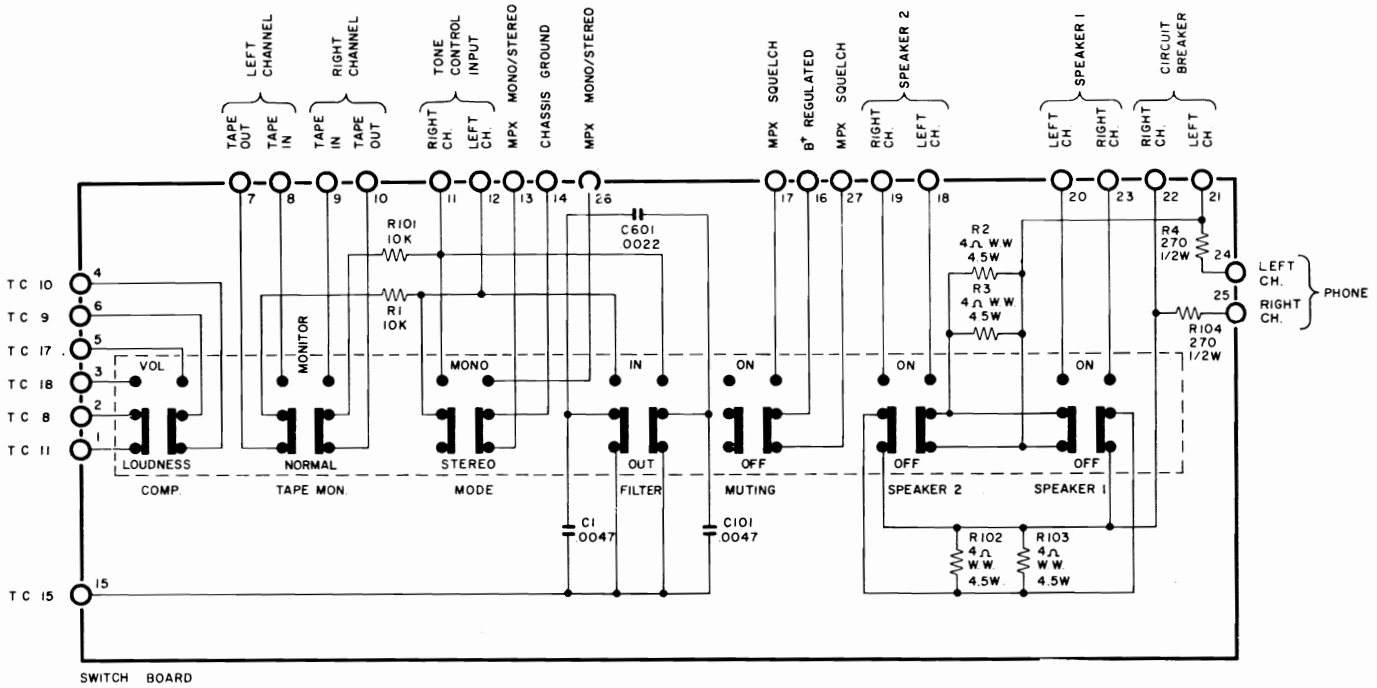
REGULATED POWER SUPPLY 019-1107-057 REV I

SWITCH ASSEMBLY

CIRCUIT DIAGRAM 100-1352-002 REV 0



PUSH BUTTON SW.

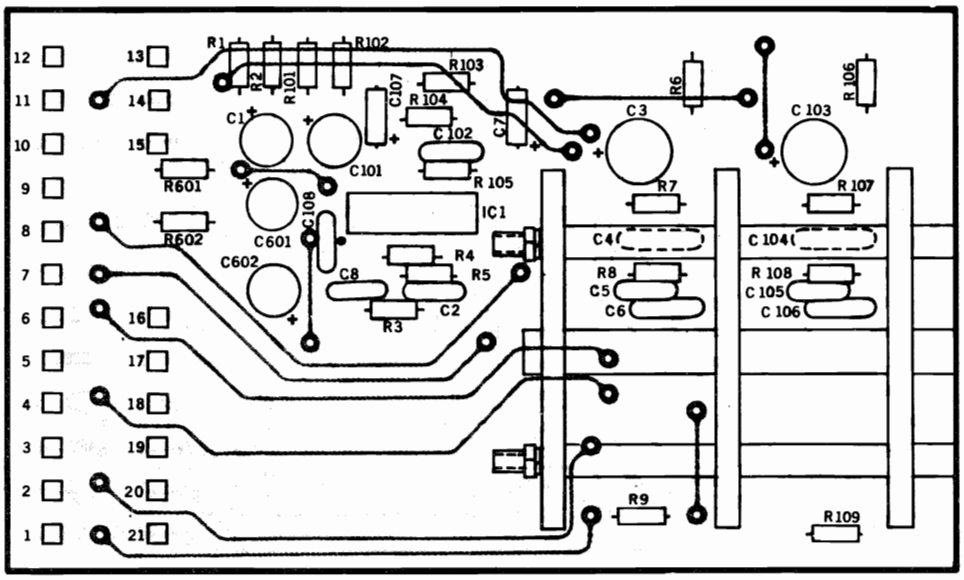


NOTES:

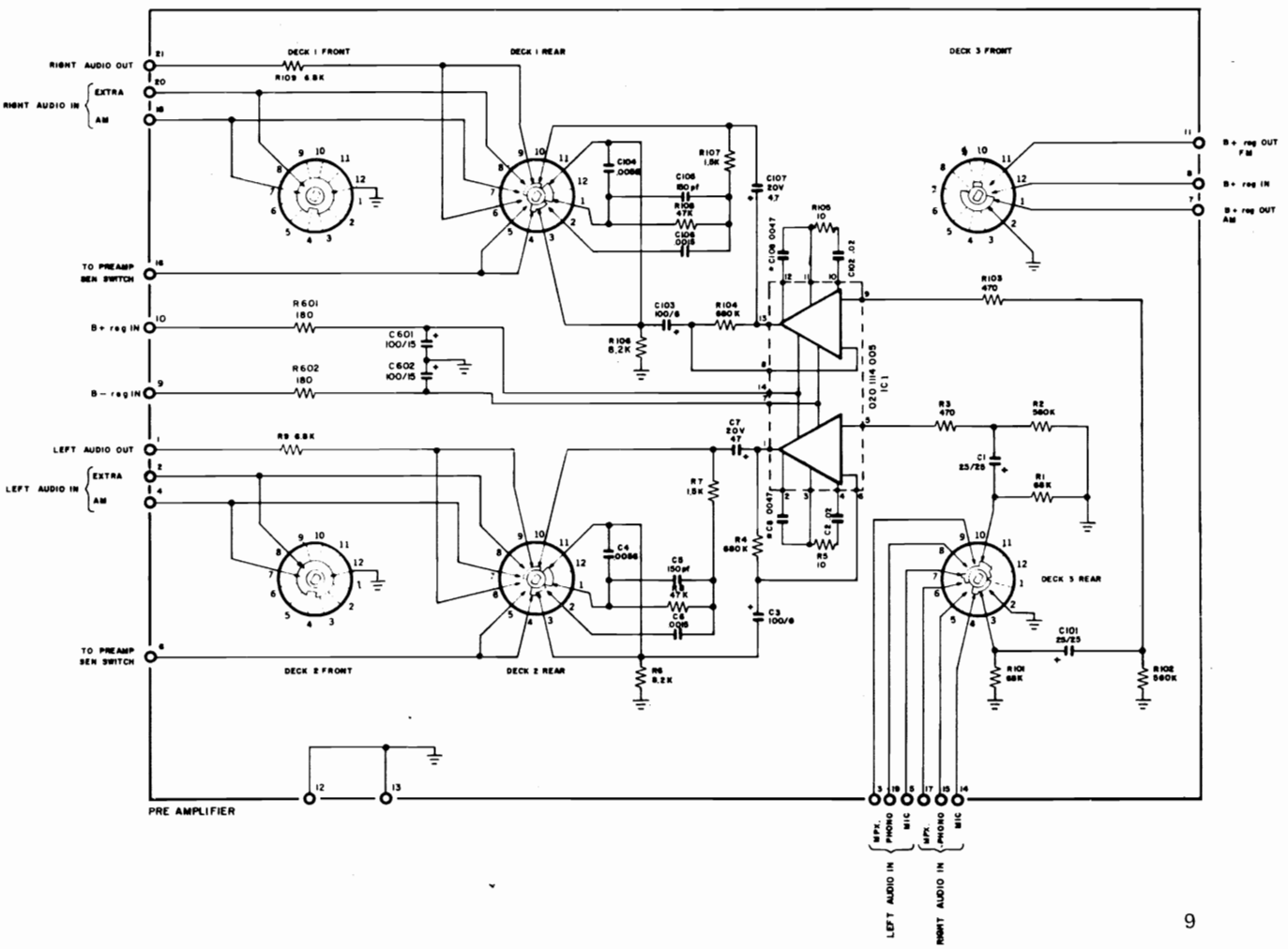
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, RESISTORS 1/4 WATT, ±10%, CAPACITANCE IN MFD'S.
2. T C = TONE CONTROL ASSY PIN NO'S
3. HIGHEST SERIES NO'S. — C1, C101, C601, R4, R104
4. REFER TO COMPONENT LABEL 019-1107-063/A REV.0

:C-1, SC5116P

CIRCUIT DIAGRAM 100-1333-014 REV I

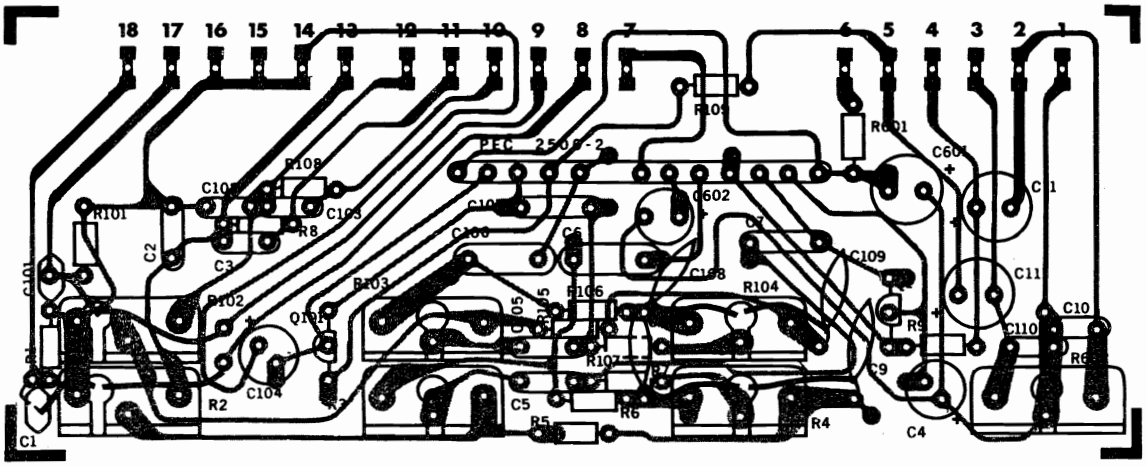


PRE-AMP

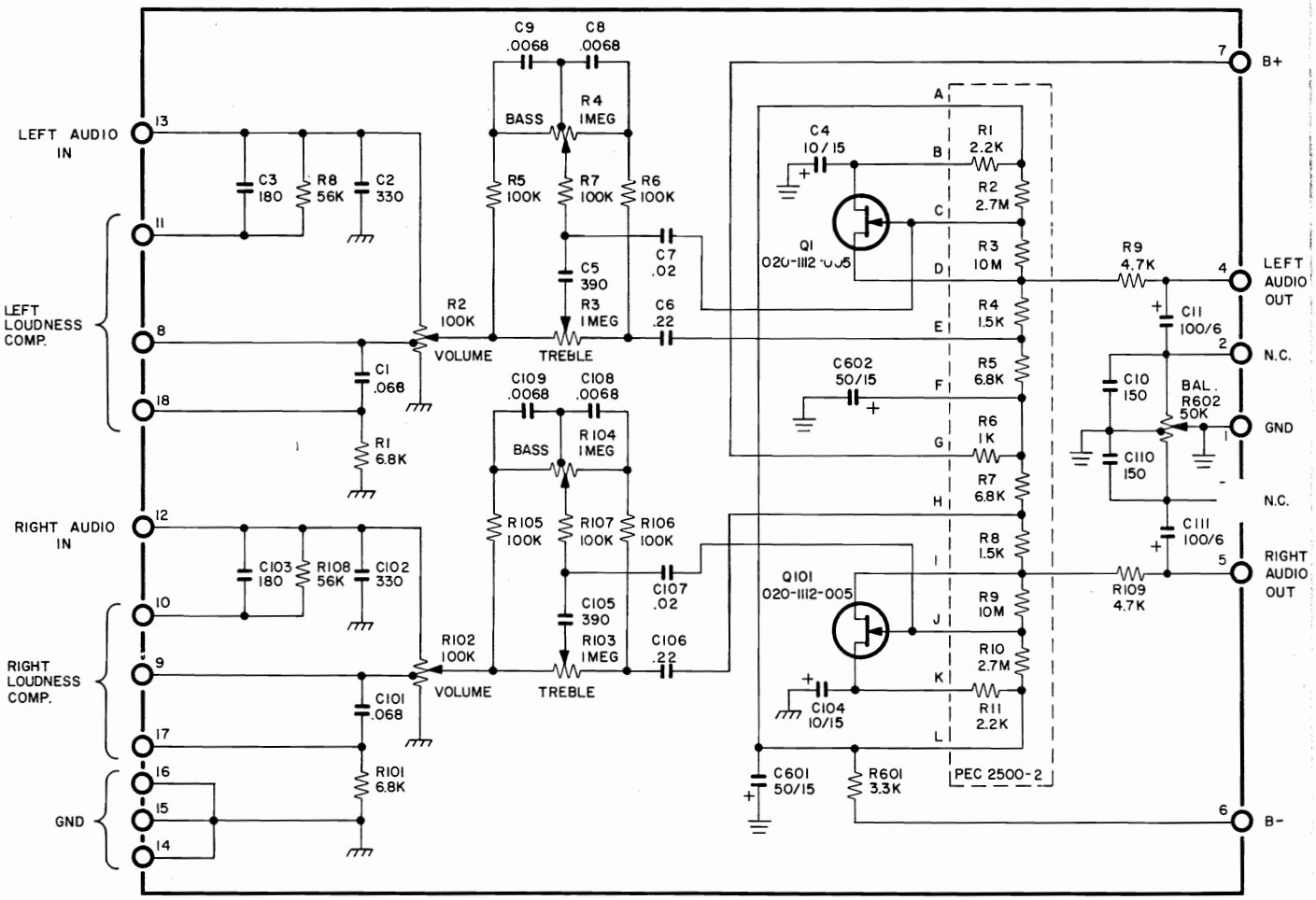


Q1, Q101 ; 020-1112-005

CIRCUIT DIAGRAM 100-1334-004 REV 1



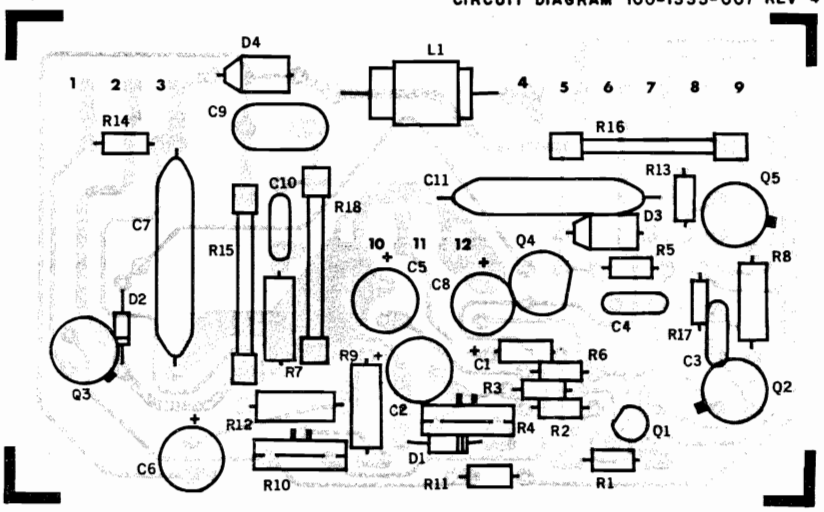
TONE CONTROL & LOUDNESS



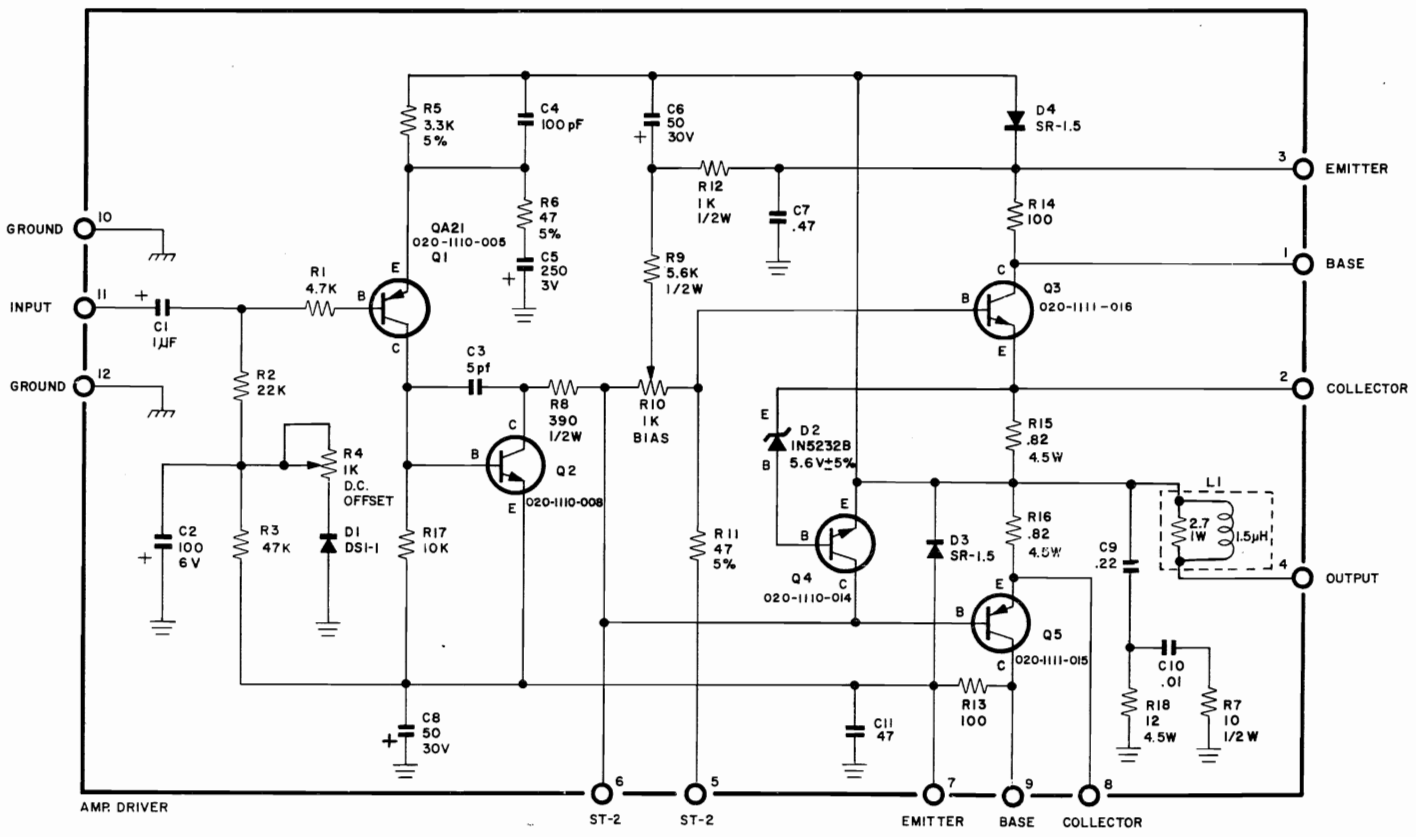
019-1107-060 REV 3

Q1; 020-1110-005
Q2; 020-1110-008
Q3; 020-1111-016
Q4; 020-1110-014
Q5; 020-1111-015

CIRCUIT DIAGRAM 100-1335-007 REV 4



DRIVER



019-1107-058 REV. 3

1. Preliminary 455 kHz Alignment

Set tuning to middle of AM band, 1000 kHz. Output from Left Tape Out jack. Input from 455 kHz generator (modulated to 30% with 400 kHz) to External AM Antenna Inputs (shorting bar removed). With 2 μV or less generator output peak the first IF can for maximum output (single tuned can). After peaking, remove 455 kHz generator leads and *reconnect* external AM antenna shorting bar.

2. Oscillator Adjustment

With tuning condenser maximum capacity (fully closed) adjust pointer to "0" on logging scale (center of pointer aligned with center of "0"). Couple output of AM generator (600 kHz modulated to 60% with 400 Hz) to loopstick with AM coupling loop, using mechanical stop for 1" penetration of loopstick. Tune unit to 600 kHz. Attenuate input of rf signal until signal level is just noticeable on scope (using maximum usable scope sensitivity). Adjust oscillator coil T203 while manually tuning unit for output peak as read on VTVM. Set AM generator to 1600 kHz modulated to 60% with 400 Hz.

Tune unit to 1600 kHz. Adjust oscillator trimmer C225 for maximum output as read on VTVM using weak rf input signal.

Repeat the above adjustments of oscillator coil and oscillator trimmer until no further improvement can be made.

3. Antenna Trimmer Adjustment

Set AM generator to 1400 kHz modulated to 60% with 400 Hz. Tune unit to 1400 kHz. Adjust antenna trimmer C232 for maximum output as read on VTVM using weak rf input signal.

4. 600 kHz Measurements

With unit tuned to 600 kHz and AM coupling loop set for 1" penetration, set rf attenuator for an input to the AM coupling loop equivalent to 500 μV. Note audio output – should be between .75 and 1.25 volts from Tape Out jacks. Attenuate rf input (approx. 10.0 μV). Check audio output which should not drop more than 3.0 dB from that noted for input equivalent to 500 μV.

5. 1000 kHz Measurements

(a) With unit tuned to 1000 kHz and AM coupling loop set for 1" penetration, set rf attenuator for an input to the AM coupling loop equivalent to 500 μV. Note audio output – should be between .75 and 1.25 volts from Tape Out jacks. Attenuate rf input to approx. 10.0 μV. Check audio output which should not drop more than 3.0 dB from that noted at 500 μV.

(b) Set rf input to the AM coupling loop equivalent to a 500 μV. Measure harmonic distortion of audio output. Maximum allowable THD is 2.0%.

6. 1400 kHz Measurements

With unit tuned to 1400 kHz and AM coupling loop set for 1" penetration, set rf attenuator for an input to the AM coupling loop equivalent to approx. 620 μV. Note audio output – should be between .75 and 1.25 volts from Tape Output jacks. Attenuate rf input to 10 μV. Check audio output which should not drop more than 3 dB from a 500 μV input.

7. Calibration

(a) With AM coupling loop set for 1" penetration, set rf attenuator for an input to the AM coupling loop equivalent to a 300 μV/M field at 600 kHz. Tune unit to 600 kHz tuning for maximum Tuning Meter reading. Check calibration of Dial Pointer-should read 600 kHz ± 10 kHz.

(b) Repeat above procedure for the following frequencies:

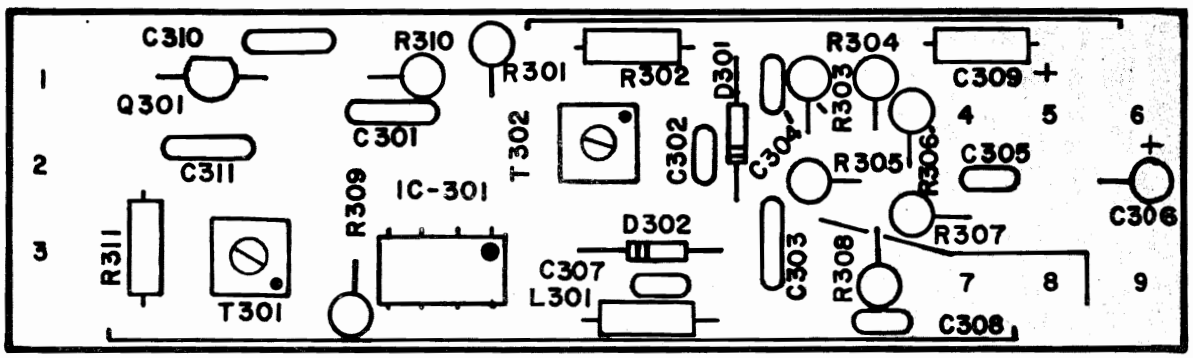
Frequency	Calibration
800 kHz	800 kHz ±10 kHz
1000 kHz	1000 kHz ±20 kHz
1200 kHz	1200 kHz ±20 kHz
1400 kHz	1400 kHz ±10 kHz
1600 kHz	1600 kHz ±10 kHz

(c) At 1600 kHz check for a rise and fall of meter indication and audio output as unit is tuned through the rf signal.

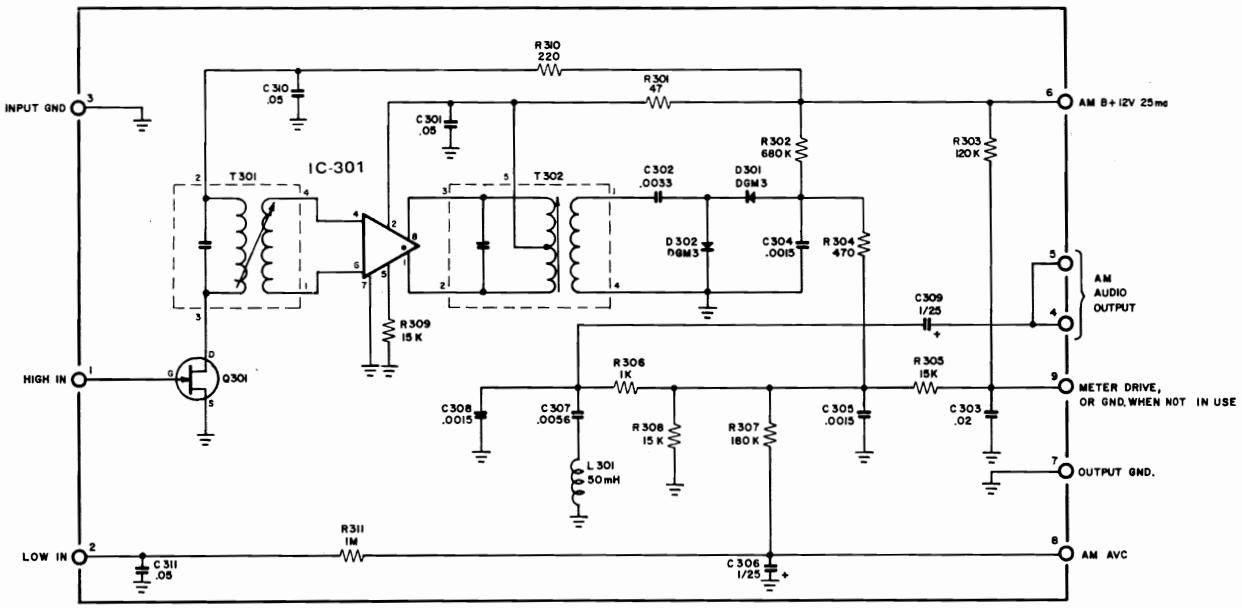
8. Final Listen AM

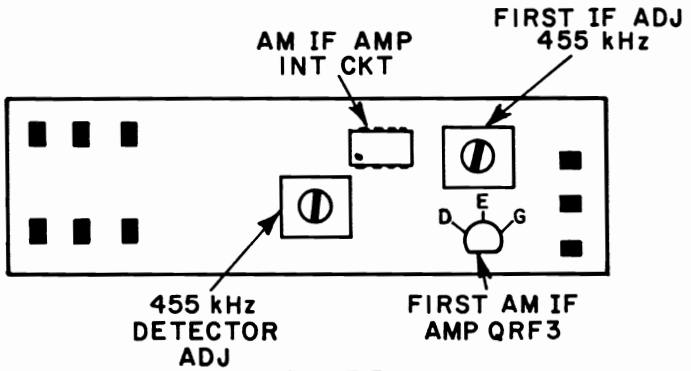
Using headphones plugged into the front panel Phone jack and Loudness control adjusted for adequate output, slowly tune across the AM dial listening for oscillations and no output indicating shorting tuning capacitor plates.

Remove shorting bar on external antenna. Connect outside antenna to unit. Check calibration and tuning meter indication using stations. Remove outside antenna, replace shorting bar and tighten screws. Turn ac power off and remove headphones from unit. Remove all test cables.

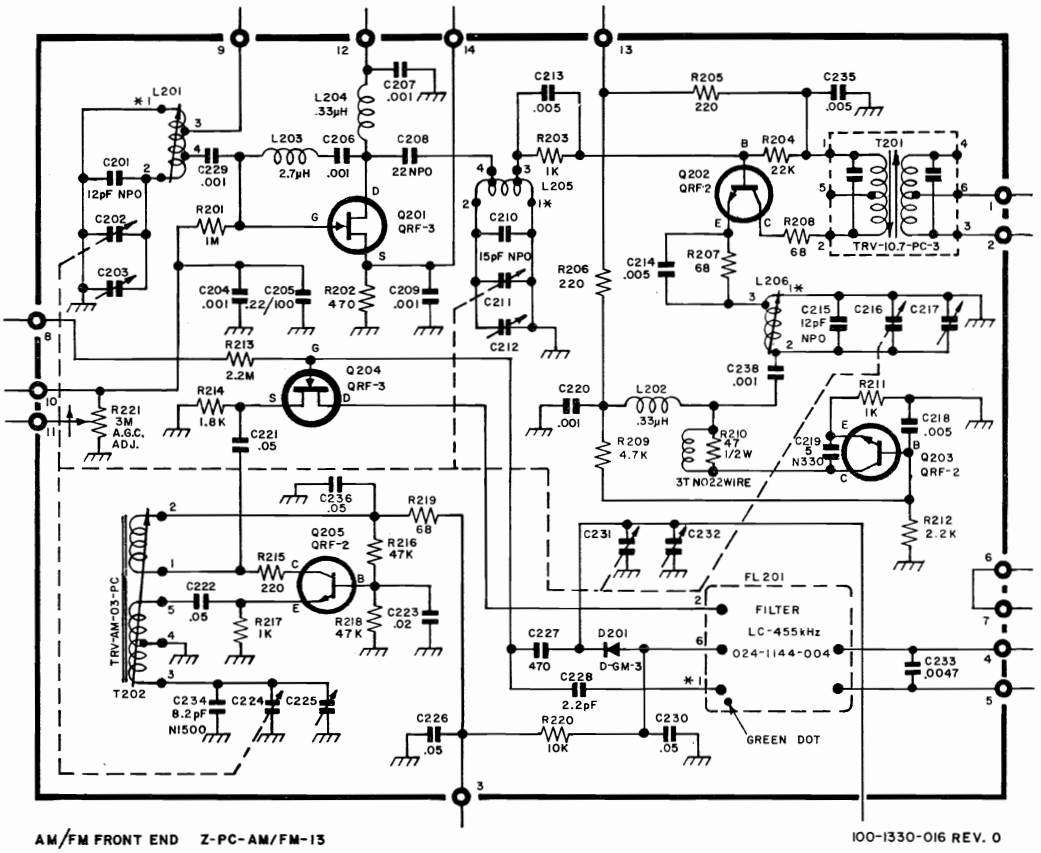


AM IF 019-1107-076





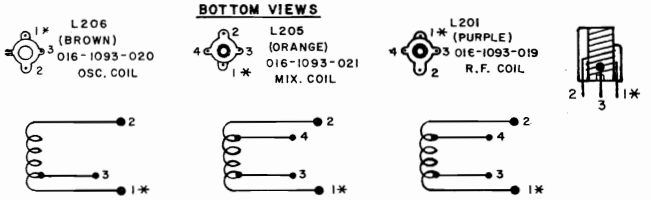
AM IF



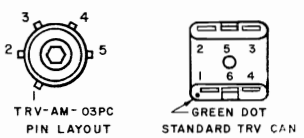
AM/FM FRONT END Z-PC-AM/FM-13

100-1330-016 REV. 0

BOTTOM VIEWS

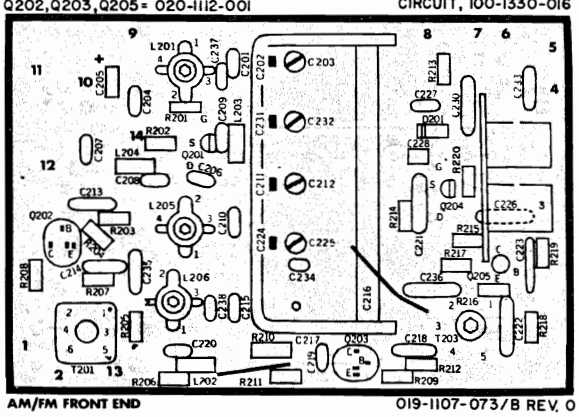


BOTTOM VIEW



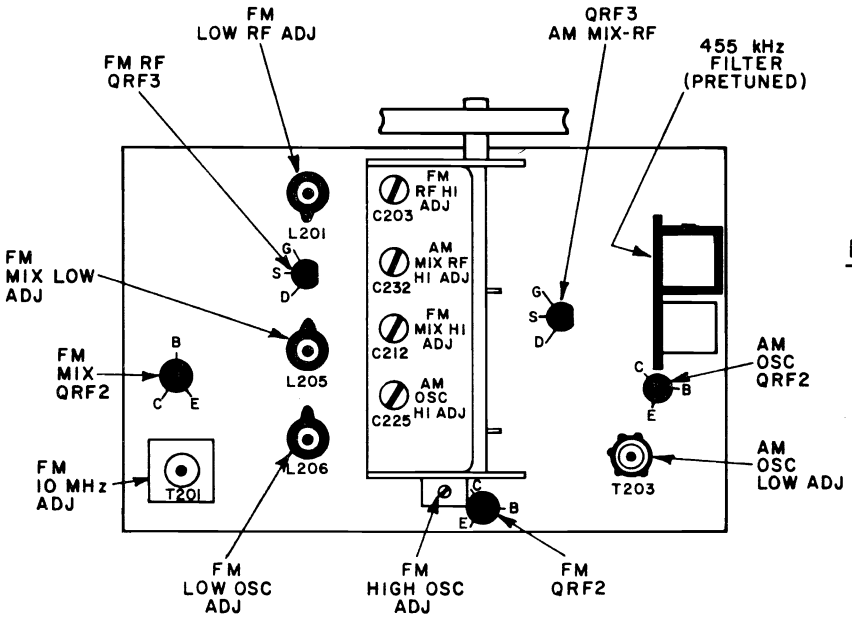
Q201, Q204 = 020-1112-008
Q202, Q203, Q205 = 020-1112-001

CIRCUIT, 100-1330-016

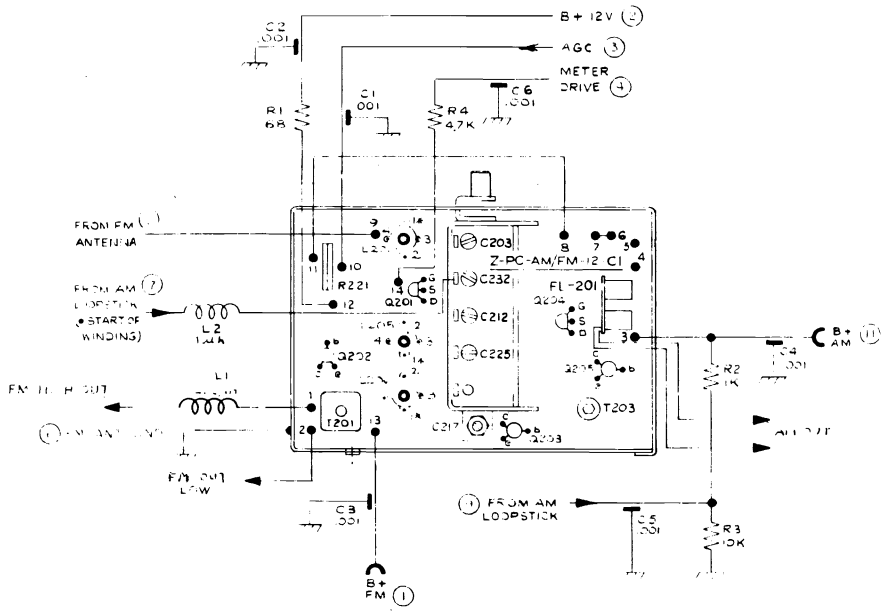


AM/FM FRONT END

019-1107-073/B REV. 0



AM-FM FRONT END



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE IN OHMS ±10%
   RESISTORS ¼ WATT
   CAPACITANCE IN MFD'S
2. ARROWS INDICATE MAIN SIGNAL PATH.
3. TRIMMERS: C203 — FM ANT. } HIGH ADJ.
   C232 — AM ANT.
   C212 — FM MIX
   C225 — AM OSC
   C217 — FM OSC
   COILS: L201 — FM RF. } LOW ADJ.
   L205 — FM MIX
   L206 — FM OSC
   TRANSFORMERS: T201 — FM I.F.
   T202 — AM
   FILTERS: FL-201 — AM
   TRANSISTORS:
   Q201 — FM RF AMP.
   Q202 — FM MIX
   Q203 — FM OSC.
   Q204 — AM RF AMP. MIX
   Q205 — AM OSC.
   POTENTIOMETER:
   R221 — AGC ADJ.

HIGHEST SERIES NUMBERS
C6
R4
L2

1. RF Section Alignment

(a) Check that all coils and trimmers are preset to their normal position.

(b) Set dial pointer to 106 MHz generator signal and adjust IF can for maximum output.

(c) Adjust oscillator trimmer for correct dial reading.

(d) Adjust mixer and antenna trimmer for maximum output; reduce output from generator so that a 20 dB S/N ratio is maintained.

(e) Set dial pointer to 90 MHz and adjust oscillator coil for maximum output.

(f) Repeat steps c, d, and e until no further improvement can be noticed.

2. FM IF Amplifier Alignment

(a) Connect oscilloscope to TAPE out jack and RF generator to 300Ω FM antenna terminal.

(b) Set generator to 90 MHz and 8μV output (4μV at ANT. terminal); modulate RF signal with 400 Hz audio (∓ 75 kHz deviation).

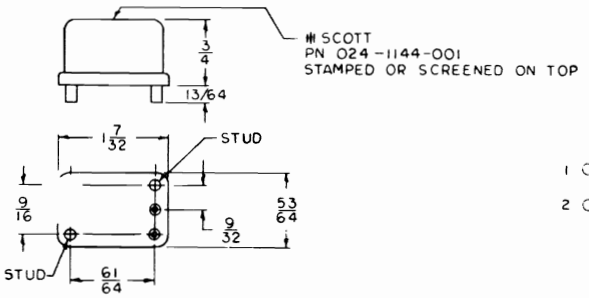
(c) Tune receiver to exact center of signal and adjust bottom of detector can for maximum output.

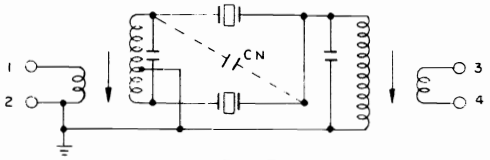
(d) Check that receiver is tuned to the *exact* center of the signal and that the 50 K potentiometer is set fully clockwise (turn to right if viewed from the front of the receiver.)

(e) Adjust top slug of detector can until Perfect Tune light turns on.

(f) Rotate 50 K potentiometer until Perfect Tune light just goes out on a 8μV signal.

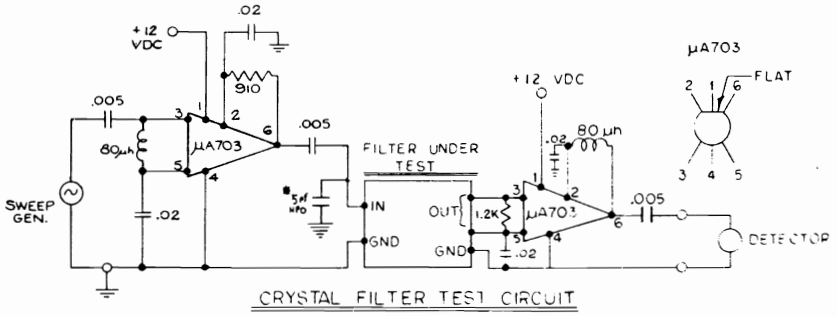
(g) Measure sensitivity at top and bottom end of FM dial to insure that receiver meets its published specifications.





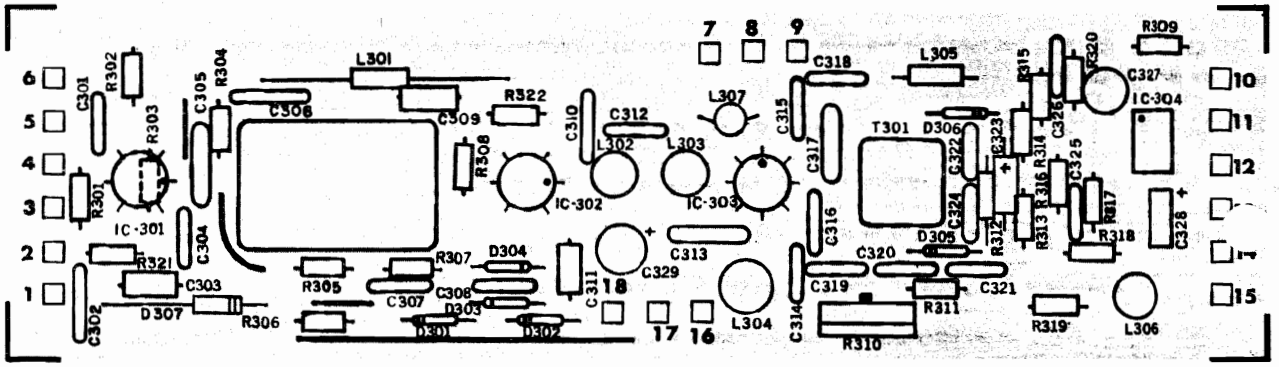
SPECIFICATIONS

CENTER FREQUENCY:	10.7 MHz
3 dB BANDWIDTH:	240 kHz (MIN.)
20 dB BANDWIDTH:	600 kHz (MAX.)
40 dB BANDWIDTH:	1200 kHz (MAX.)
INSERTION LOSS:	6 dB (MAX.)
TERMINATING IMPEDANCE:	IN/OUT 900 ohms/10 pF
OPERATING TEMPERATURE RANGE:	-10°C TO 50°C
PASS BAND RIPPLE:	1 dB (MAX.@ 20°C TO 50°C)



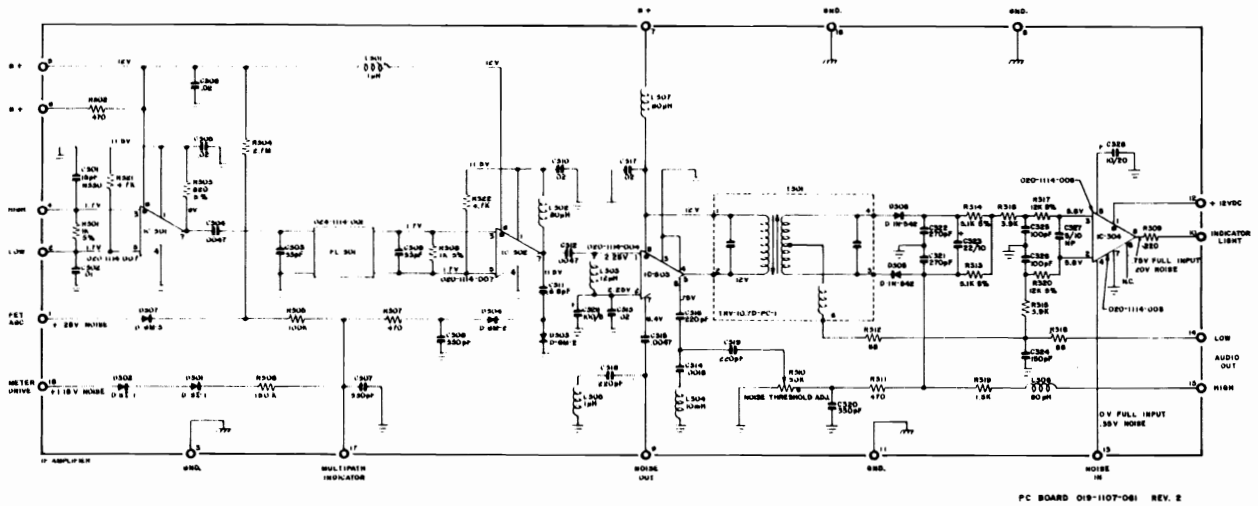
IC-301 μA703 020-1114-001
IC-302 μA703 020-1114-001
IC-303 μA719 020-1114-004
IC-304 (SC5117) 020-1114-006
FL-301 024-1144-001

CIRCUIT DIAGRAM 100-1331-013 REV. 8



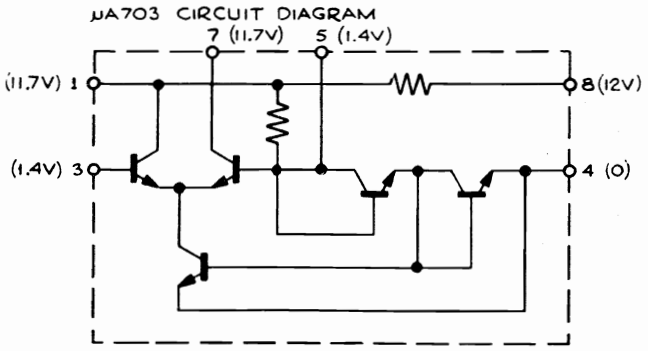
CRYSTAL FILTER IF AMP.

019-1107-061 Rev. 7

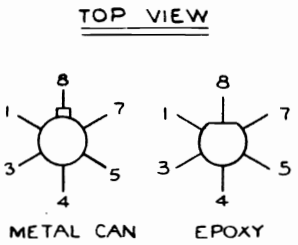


PC BOARD 019-1107-061 REV. 2

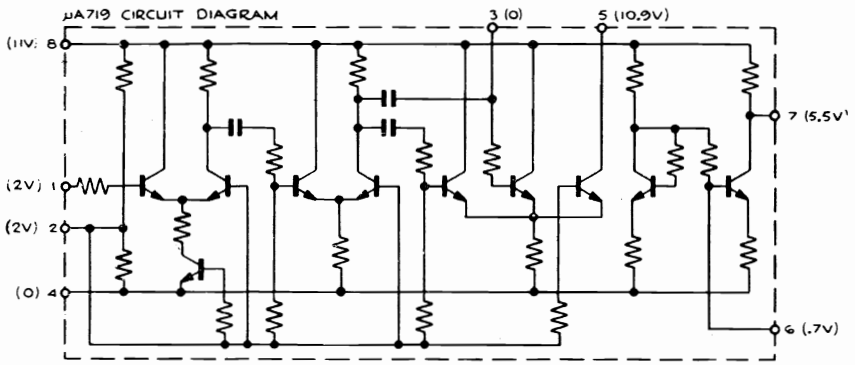
NOTES
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE IN OHMS ±10% 1/4 WATT, AND CAPACITANCE IN MFD'S.
2. HIGHEST NUMBER SERIES IC304, FL301, T301, L307, C325, R322, D307
3. DOT ON POTENTIOMETER INDICATES EXTREME CW POSITION VIEWED FROM KNOB END.

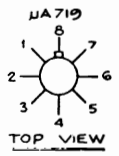


020-1114-007 LOW GAIN μA 703
020-1114-008 HIGH GAIN μA 703

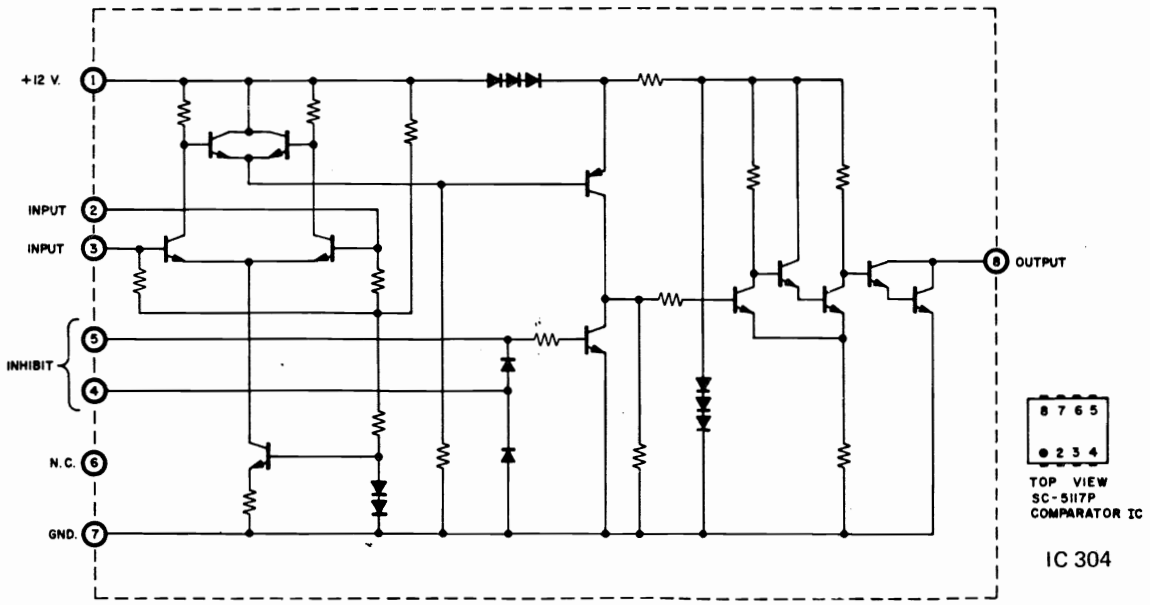


IC 301, 302





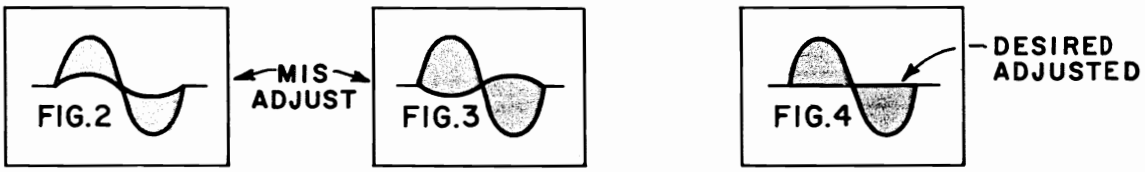
IC 303



IC 304

MULTIPLEX ALIGNMENT

(1) With the two pots at max in direction shown by Fig. 1, prepare to align the 67 kHz trap and the HF SEP trap. Tune to a signal modulated with 67 kHz and with a low capacity troubleshooting probe on IC pin 3, adjust the 67 kHz trap for minimum output. Leave probe on pin 3, tune to a stereo signals and adjust HF SEP trap for a straight base line as shown in Fig. 4.



(IF THE NEXT SET OF ADJUSTMENTS ARE NOT DONE CAREFULLY, PROPER SEPARATION WILL BE DIFFICULT TO ACHIEVE)

(2) Move probe to IC pin 1, while still on a stereo signal adjust first 19 kHz can for *maximum* output. The second 19 kHz can should also be adjusted at this point for *maximum* output as viewed on the scope.

(3) Move troubleshooting probe to IC pin 13 and align the 38 kHz can for *maximum* output. (No alignment of the 19 kHz circuits should be done with troubleshooting probe at this point).

(4) Now that all the alignment has been completed, separation can be achieved in the usual manner by rotating the separation pot. Adjust for MAXIMUM achievable separation (absolute minimum of 30 db).

(5) Any phasing that is required must only be done by slight adjustment of the first 19 kHz can and only the first 19 kHz can. (Touch up for maximum separation.)

If the 19 kHz and 38 kHz adjustments were done carefully, separation should fall within ± 2 db between channels and going back and forth between stereo signals for readjustment should not be necessary.

(6) To set stereo light and muting, set muting switch to on position, turn mute light, adjust pot until unit mutes on interstation noise.

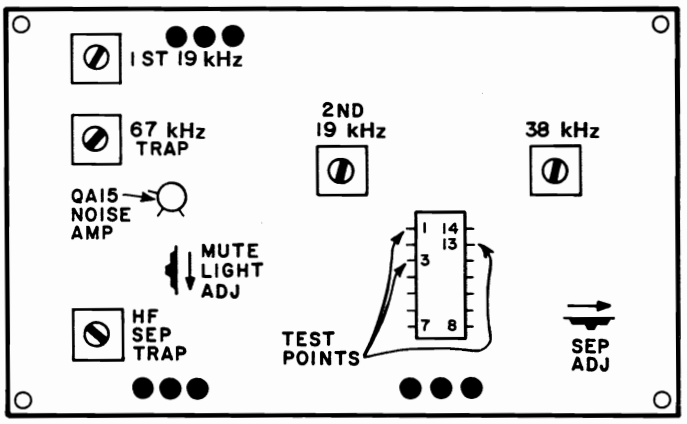
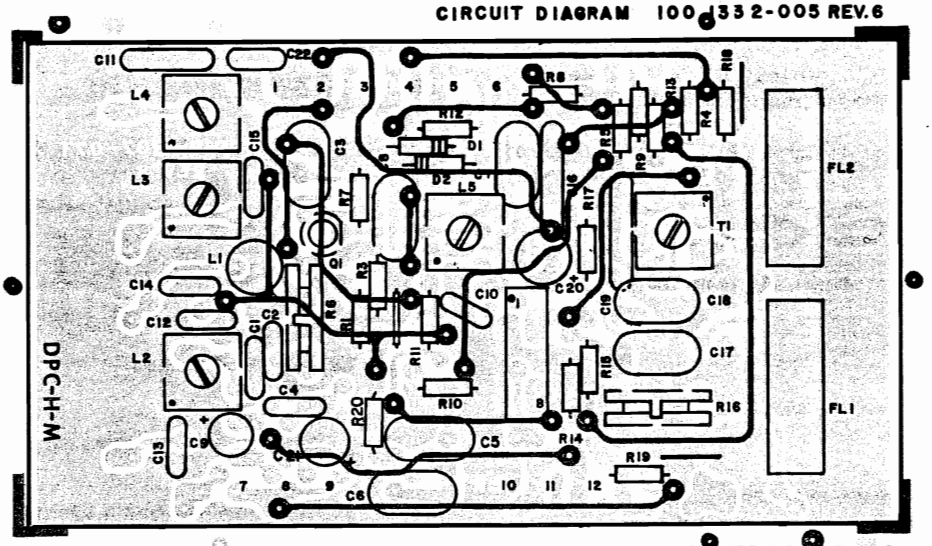
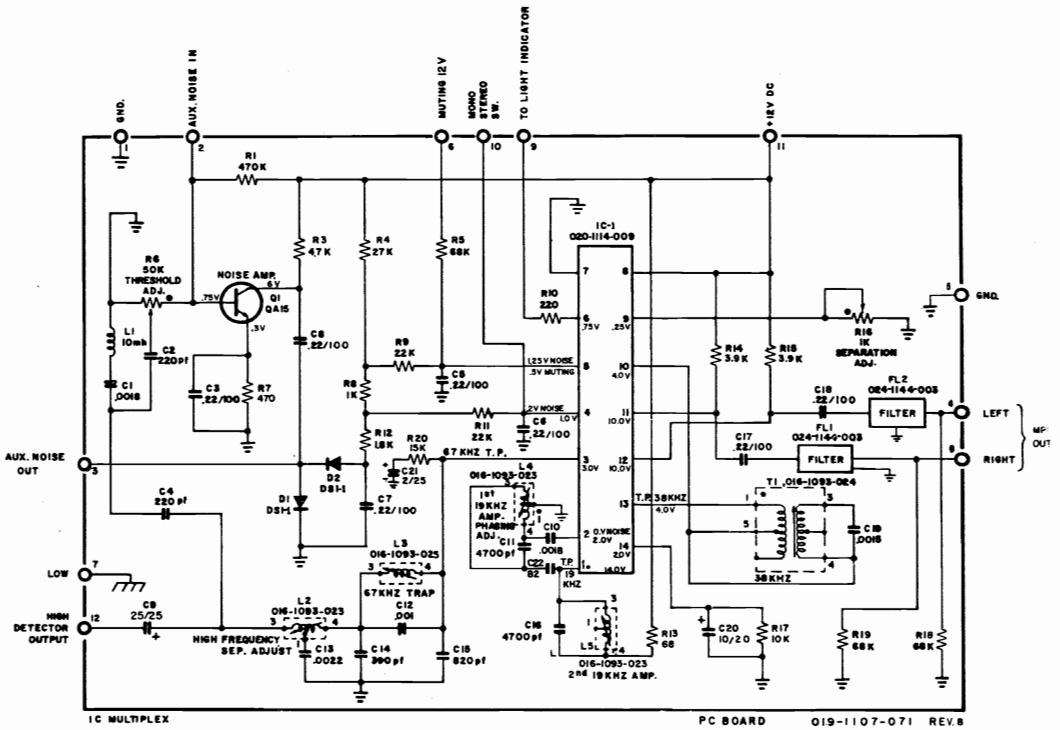


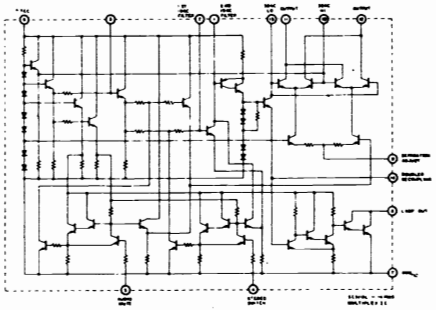
FIG. I

CIRCUIT DIAGRAM 100-1332-005 REV.6

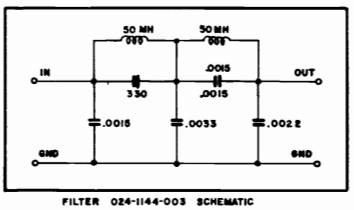


IC MULTIPLEX 019-1107-071 Rev. 8





IC-1 020-1114-009
MULTIPLEX IC



FILTER 024-1144-003 SCHEMATIC

(19 kHz & 38 kHz)

CIRCUIT VOLTAGES 386 UNLESS OTHERWISE SPECIFIED

ALL DC VOLTAGES (±15%) MEASURED WITH RESPECT TO CHASSIS GROUND, USING 20K Ω/V.V.O.M., AT 117VAC LINE, 300 Ω LOAD ON EXTERNAL ANTENA TERMINALS, TUNER OFF STATION AND INPUT IN "FM" POSITION.

* VOLTAGES MEASURED UNDER SAME CONDITIONS AS ABOVE ONLY MODE SWITCH IN "STEREO" POSITION WITH STEREO SIGNAL FED INTO TUNER.

** VOLTAGES MEASURED WITH INPUT SWITCH IN "AM" POSITION AND NO SIGNAL.

▲ PIN DELETED.

▲▲ HIGH INPUT IMPEDANCE METER ONLY (10 MΩ OR HIGHER).

■ ON AM ONLY.

■■ ON FM ONLY.

● DC OFFSET VOLTAGE ADJUSTMENT.

●● AFFECTED BY DC OFFSET ADJUSTMENT.

●●● AUDIO OUTPUT

1. MAIN POWER SUPPLY
   B + 33V
   B − 33V

2. REGULATED SUPPLY −100-1340-012

	E	B	C
Q1	13	13	23
Q2	0	0.6	13
Q3	0	−0.6	−13.8
Q4	−13	−13.8	−23.7

AMP	1	2	3	4	5	6	7	8	9	10	11	12
PINS	+31	+31	0	0	−31	−31	+13	+13	0	0	−13	−13

3. AM-FM FRONT END − 100-1330-016

	E	B	C
Q202	0.2	0.8	10.4
Q203	3.4	3.0	10.4
Q205	0	0	0

**	E	B	C
	0.2	0.8	10.4
	3.4	3.0	10.4
	3.6	4.0	10.4

	GATE	DRAIN	SOURCE
Q201	0	11.0	1.7
Q204	0	0	0

**	GATE	DRAIN	SOURCE
	0	11.0	1.7
	0	8.8	1.7

4. FM IF AMP − 100-1331-013

	1	2	3	4	5	6	7	8
IC301	11.5	▲	1.7	0	1.7	▲	9	12
IC302	11.5	▲	1.7	0	1.7	▲	11.5	12
IC303	2.25	2.25	0	0	12	.75	6.4	12
IC304	12	5.8	5.8	.35‡	.35	0	0	10

AMP	1	2	3	4	5	6	7	8	9
	+.25	1.7	0	1.7	12	12	12	0	.35‡
PINS	10	11	12	13	14	15	16	17	18
	10	0	12	.35‡	5.8	5.8	0	0	+1.2

‡ WITH TUNER ON STATION READ 0 VOLTS.

5. IC MULTIPLEX − 100-1332-005

	E	B	C
Q1	0.4	0.7	6.2

VOLTAGES DO NOT CHANGE FROM "MONO" TO "STEREO" MODE ON Q1.

IC-1	1	2	3	4	5
	10.5	0	2.5	0	1.2
	6	7	8	9	
	18	0	11	0.25	
	10	11	12	13	14
	3.5	9.0	9.0	3.5	0

*	1	2	3	4	5
	10.5	2	2.5	1	1.2
	6	7	8	9	
	0.7	0	11	0.25	
	10	11	12	13	14
	3.5	9.0	9.0	3.5	1.3

6. AM IF − 100-1331-017

	1	2	3	4	5	6	7	8
IC-301	11.7	11.7	0	4	5	4	0	11.7

	1▲▲	2▲▲	3	4	5	6	7	8	9
AMP PINS	−.1	−.1	0	0	0	+13	0	−.1	0

7. PREAMP − 100-1333-014
   DO NOT ATTEMPT TO MAKE ANY MEASUREMENT DIRECTLY ON THE IC PINS.

	1	2	3	4	5	6	7■
	0	0	0	0	0	0	+13
AMP PINS	8	9	10	11■■	12	13	14
	+13	−13	+13	+13	0	0	0
	15	16	17	18	19	20	21
	0	0	0	0	0	0	0

8. TONE CONTROL − 100-1334-004

	DRAIN
Q1	−1V TO +3V
Q101	−1V TO +3V

AMP	1	2	3	4	5	6	7	8	9
	0	0	0	−1 to +3	−1 to +3	−13	+13	0	0
PINS	10	11	12	13	14	15	16	17	18
	0	0	0	0	0	0	0	0	0

9. DRIVER − 100-1335-007 (LEFT & RIGHT CHANELS)

	E	B	C
Q1	−.3	−.8	−30
Q2	−31	−30	−2.2
Q3	0	+.5	30.5
Q4	0	−.3	−.5
Q5	0	−.5	−30.5

	1	2●	3	4●●●	5●●	6●●
AMP	+30.5	0	+31	0	+.5	−.5
PINS	7	8	9	10	11	12
	−31	0	−30.5	0	−1 to +3	0

10. OUTPUT TRANSISTOR
    (DC OFFSET ADJUSTMENT MUST BE ACCURATE)

	E	B	C
Q1, Q101 (020-1111-008)	−31	−30.5	0
Q2, Q202 (020-1111-009)	+31	+30.5	0

11. SWITCH ASSEMBLY − 100-1352-002
    AMP PINS - ALL ZERO VOLTAGE EXCEPT
    PIN 16 — 12V
    PIN 27 — 12V WHEN MUTING OFF.

12. RESISTANCE IN OHMS ± 10% 1/4 WATT. CAPACITANCE IN MFD'S.

13. HIGHEST SERIES NUMBERS; R2, R102, R606, C2, C102, C408, C604, D1, D101, D401, F1, F101, F401, Q2, Q102, T401, PEC-401.

14. SI SELECTOR SWITCH 023-1137-041.

POSITION	FUNCTION
1	MIC
2	PHONO
3	FM
4	AM
5	EXTRA

15. ARROW HEADS INDICATE MAIN SIGNAL PATH.

16. THE FOLLOWING CONTROLS IN THE LEFT CHANNEL ARE MECHANICALLY GANGED WITH IDENTICAL CONTROLS IN THE RIGHT CHANNEL; BASS, TREBLE, AND LOUDNESS.

D.C. OFFSET VOLTAGE
WITH NO SIGNAL APPLIED, READ 0 VOLTS ±150mV AT SPEAKER OUTPUT JACK, WITH RESPECT TO CHASSIS.

BIAS CURRENT
BIAS CURRENT OF THE POWER AMP P.C. BOARD SHALL BE MEASURED AS FOLLOWS:
V.O.M. SET TO MEASURE D.C. CURRENT.
MINUS OR COMMON PROBE OF V.O.M. TO COLLECTOR OF Q101 AND POSITIVE PROBE TO COLLECTOR OF Q102.
READ 1.2mA (±5%), NO SIGNAL PRESENT; 1.6mA WARM.

A.G.C. VOLTAGE (FRONT END A.G.C. TERMINAL)
+.05V TO −1.75V WITH 0 TO 100 KμV SIGNAL FED INTO 300 Ω EXTERNAL FM ANTENNA.

REVISIONS			
SYM	DESCRIPTION	DATE	APPR
1	ECO 2981	9 18 69	
2	ECO3003	9-29-69	
3	ECO 3049	10/16/69	
4	ECO 3155	12-23-69	
5	ECO 3183	1-21-70	
6	ECO 3222	1-28-70	
7	ECO 3229	1-28-70	
8	ECO 3236	2-2-70	

TONE CONTROL 100-1334-004
BALANCE
BASS
TREBLE
LOUDNESS
SWITCH ASSEMBLY 100-1352-002
VOL COMP S3
TAPE S4
MODE S5
NOISE FILTER S6
FM MUTING S7
SP2 S8
SP1 S9
L IN
L OUT
R OUT
R IN
TAPE
SPEAKER 1
SPEAKER 2
D1 012-1022-002
LEFT DRIVER 100-1335-007
D101 012-1022-002
RIGHT DRIVER 100-1335-007
C2 .01μF
C102 .01μF
Q1
Q2
Q101
Q102
020-1111-008
020-1111-009
L OUT
R OUT
LIN
RIN
-33V
+13V
-3V
PHONO INPUT
EXTRA
EXTRA
PHONO INPUT
C101
C1
.0047
.0047
S11
NORM
BALANCE
LEFT
RIGHT
PHONES
MUTE
F1 2A SLO-BLO
F101 2A SLO-BLO
-13V
+13V
-13V
C401 5000uf 40V
C402 5000uf 40V
C407 .01
C408 .01
D401 012-1025-002 BRIDGE RECTIFIER ASSEMBLY
PRE AMP 100-1333-014
S1 INPUT SELECTOR SWITCH 023-1137-041
IC1
LEFT
R603 5K
SIGNAL STRENGTH METER 017-1095-017
IC MULTIPLEX 100-1332-005
L4
L3
L2
L5
T1
R6
R16
IC1
Q1
RIGHT
R604 2.2K 1W
STEREO
PERFECTUNE
030-1370-001
POWER SUPPLY 100-1340-012
+33V
+13V
AM,IF AMP 100-1331-017
IC 301
T302
Q301
C403 .01
C404 .01
C405 47/250
YEL
RED
T401 024-1140-033 POWER TRANSFORMER
R101 910Ω
R1 910Ω
R102 910Ω
R2 910Ω
HIGH
S2
LOW
PRE AMP SENS. SW.
MIC INPUT RIGHT
MIC INPUT LEFT
+13V FM
+13V AM
AM/FM INDICATOR 030-1370-003
R601 68Ω
FRONT END 100-1330-016
C602 .02
C604 .02
R605 2.2K 1W
C603 10uf
FL 301
IC 301
IC 302
IC 303
IC 304
T 301
R 301
IF AMP 100-1331-013
+13V
LAMPS 1847 4 PLACES
GRN
BLK
021-1126-009 PEC-401
F401 1.5A S.B.
.0047 1.4KV
820K
C406 .0047 1.4KV
SIO
ON
OFF
POWER SW.
UNSWITCHED 117V OUTLET
250W MAX.
POWER SW. AND LOUDNESS CONTROLS ARE MECHANICALLY GANGED TOGETHER
R606 18Ω
POINTER LAMP 030-1189-015
117 V 50-60 Hz
FERRITE LOOP ANTENNA
HIGH
C601 4.7 pf
EXTERNAL
R602 2.7M
FM ANTENNA
AM ANTENNA 300Ω GND

APPROVED FOR PRODUCTION		H.H.SCOTT, INC. MAYNARD, MASS.	
DRAFT JA	APPROVED ONLY FOR: PILOT	CIRCUIT DIAGRAM	
CH	SAMPLE	SIZE D	DWG NO 386-CI REV 8
ENG	QUOTE	SCALE —	SHEET 1 OF 2 DATE 5/1/69
PROD			
MATERIAL			
FINISH			

QTY PER UNIT	PART NUMBER	OLD PART NUMBER	DESCRIPTION	
2	011-1000-003	CC-.005	Ceramic Capacitor	
1	011-1000-011	CC-.0047/1.4KV	Ceramic Capacitor	
2	011-1000-017	CC-.01 20%	Ceramic Capacitor, 20%	
1	011-1000-018	CC-.02	Ceramic Capacitor, 20	
2	011-1004-021	CEC-5000/40	Filter Capacitor, CEC	
1	011-1008-010	CMM-0.47/250v	Mylar Capacitor	
1	011-1010-004	CTT-22/10	Tantalum Capacitor	
1	011-1012-009	CC-4.7	Tubular Capacitor,Min.	
2	012-1022-002	D-ST-2	Stabistor	
1	012-1025-002		Bridge Rectifier	
4	013-1031-010	F-SB-2	Fuse, Slo-Blo	
1	013-1031-009	F-SB-1½	Fuse, Slo-Blo	
1	015-1060-004	J-2-Q-S	In-put Jack	
3	015-1060-006	J-2-D	In-put Jack	
2	015-1061-006	J-3-ST-7	Phone Jack	
1	015-1061-007	J-3-ST-8	Phone Jack	
1	015-1065-009	J-18	Antenna Plug	
1	017-1095-017		Meter	
3	018-1100-032		Knob, Single	
2	018-1100-033		Knob, Rear	
	018-1100-034		Knob, Front	
	018-1100-035		Knob, Tuning	
	018-1102-094		Panel	
1	018-1104-017		Panel In-lay (Bronze Finish)	2996
1	018-1105-071		AM/FM Dial	2961
2	020-1111-008		Power Transistor	
2	020-1111-009		Power Transistor	
1	021-1120-088	RC11-18Ω	¼ Watt Resistor	
4	021-1120-078	RC11-910-5	¼ Watt Resistor, 5%	
1	021-1121-064	RC21-2.7M	½ Watt Resistor	
1	021-1121-009	RC21-68	½ Watt Resistor	2981
2	021-1122-013	RC31-2.2K	1 Watt Resistor	2981
1	021-1125-008	RCV-5K-PH	Potentiometer	
1	021-1126-004		Packaged Capacitor/ Resistor	
1	023-1135-023		Wire-wrap Slide Switch	
1	024-1140-033		Power Transformer	
1 set	029-1176-013	D-INT-1A	Production Tags	
1	028-1167-022	CTF-55	Envelope	
1	028-1171-001		Elastic band	
1	028-1167-025		Poly Bag	3119
1	028-1165-014	CT-GG	Carton	
2	028-1166-029	CTF-GC	Filler	
6	028-1169-002	CTF-24	Staple	
2	028-1166-031	CTF-GGR-2	Filler	
1	028-1168-016		Poly Bag	
1	029-1176-009	D-GEN-71	Warranty Card Envelope	
1	029-1172-005	D-GEN-26	Warranty Card	
1	029-1172-050		Trouble shooting guide	
1	029-1172-038	D-GEN-73		
1	029-1173-061		Instruction Book	
1	029-1174-128		Carton Label	
	026-1152-004	WP-6xT-1	Line Cord	
	029-1172-062		Addendum sheet	3083
1	029-1176-010	D-TKP-1	Tuning Knop Protector	3093
1	029-1172-001	D-ENV-4	Envelope	3106
1	029-1174-116	D-GEN-102	1 label to be placed on Master Carton	
			1 label placed on each Single Carton	

QTY PER UNIT	PART NUMBER	OLD PART NUMBER	DESCRIPTION	
When using Double-Pack the following are used:				
1	028-1165-062	CT-GG-2	Carton	
1	029-1174-128		Carton Label	
2	028-1169-001	CTF-16	Staple	
16	028-1169-009	Ctf-53	Staple	
2	030-1181-008	A-TL-60747-1	Solder-less Terminals	
13	030-1181-025		3 Post, Amp Connectors	
12	030-1181-026		6 Post, Amp Connectors	
10	030-1183-014		Ground Lug	3063
3	030-1183-002	R-T-6	Ground Lug	3033
1	030-1183-008	H-T-342	Lug	2925
4	030-1185-001	I-TO-3	Mica Wafer	
1	030-1186-022	E-RCV-1	Fish-paper Shield	
1	030-1187-001	TS-S2	Terminal, Screw Strip	
1	030-1187-003	TS-S2-L	Terminal, Screw Strip	
1	030-1187-011	TS-S4-B1	Terminal Block, Antenna	
1	030-1188-005	TS-1 MA	Terminal Strip, Min.	3033
2	030-1188-008	TS-2M	Terminal Strip, Min.	2937
1	030-1188-011	TS-3M	Terminal Strip, Min.	2937
4	030-1189-008	V-PL-1847	Bulb	
1	030-1190-006	X-PL-U4-7	Socket	
3	030-1190-012	X-PL-U10	Socket	
3	030-1192-001	XF-3AG	Fuse Post w/nut & washer	3083
4	030-1193-001	X-Q-3	Transistor Socket	
1	030-1194-001	X-AC-MR	AC Out-let	
1	030-1194-003	X-AC-SAR	AC Out-let, Red	
2	030-1269-002	I-NS-8	Nylon Sleeve	
1	030-1285-003	I-J-2-Q	Jack Insulator	
3	030-1285-002	I-J-2-D	Jack Insulator	
1	030-1370-001		Indicator Assy	
1	030-1370-003		AM-FM Indicator Assy.	
2	031-1195-010	A-CL-38	CEC Clamp	
13	031-1195-013	A-CL-503-P	Cable Clamp	3054
2	031-1195-053		Stabistor Mtg. Clamp	
1	031-1197-008	A-DC-18	Dial Cord	
1	031-1198-014		Dial Pointer	
4	031-1200-001	A-FT-1	Plastic Feet	3084
4"	031-1202-008	A-PS-10	Tape	
2pcs	031-1202-040		Meter Tape	
2	031-1203-001	A-PY-3/8	Nylon Pulley	
3	031-1203-005	A-PY-1/2N	Nylon Pulley	
7	031-1208-003	A-SB-437-4	Snap Bushing	
1	031-1208-004	A-SB-625-8	Snap Bushing	
1	031-1209-010	H-CS-3	Spring	
1	031-1209-011	H-CS-4	Spring	
1	031-1212-001	A-X-40	Deflector	
1	031-1215-009	EP-1	Light Shield	
1	031-1241-006	Flywheel Assy.	Consists of: 1-031-1241-005 Flywheel 1-031-1328-009 Cord Drive	
19	031-1360-001	N	Nylon PC Stand-off's	
2	032-1243-006	A-CL-P17	Clamp	
1	032-1250-254		Meter Bracket	2872
1	032-1250-115	A-CB-137	Switch Mtg. Brkt.	
2	032-1250-120	A-CB-147	Extention Slide Brkt.	
2	032-1250-121	A-CB-143	Antenna Mtg. Brkt.	
1	032-1250-209		Diffuser Brkt.	
1	032-1250-232		Pulley Brkt.	
1	032-1250-233		Pulley Brkt.	
1	032-1250-234		Pulley Brkt.	
1	032-1250-238		Chassis Support Brkt.	
1	032-1250-239		Chassis Support Brkt.	

QTY PER UNIT	PART NUMBER	OLD PART NUMBER	DESCRIPTION	
1	032-1250-240		Pulley Brkt.	
2	032-1250-246		Chassis Brkt.	
1	032-1250-235		Light Brkt.	
4	032-1251-030	A-BC-52	Transistor Cover	
1	032-1251-108		Top Cover	
1	032-1251-109		Bottom Cover	
1	032-1251-091	2-AM/FM-11-M2	Top Cover (F/E)	2925
1	032-1252-097		Front Chassis	3083
1	032-1252-116		Rear Chassis	
1	032-1252-100		Main Chassis	
1	032-1256-010		Dial Pointer Track	2770
2	034-1270-028		Caution Label	2770
1	035-1275-002	Z-ANT-FM-4	FM Antenna	3022
1	035-1276-010	Z-ANT-AM-12	AM Antenna (See Antenna Parts List)	
1	100-1330-016		Front End Assy.	
1	100-1331-013		IF Board Assy.	
1	100-1331-017		AM/IF Board Assym	
1	100-1331-017		AM/IF Board Assy.	
1	100-1332-005		Multiplex Board Assy.	
1	100-1333-014		Pre-amp Board Assy.	
1	100-1334-004		Tone Control Board Assy.	

QTY PER UNIT	PART NUMBER	OLD PART NUMBER	DESCRIPTION
2	100-1335-007		Driver/Amp. Board Assy.
1	100-1340-012		Regulator Board
1	100-1352-002		Push-button Switch Board
			*Use up Stock of FM-2

286/13 100/220 V OVERSEAS

DELETE:

1	024-1140-033		Transformer
1	030-1194-003		X-AC-SAR
1	018-1102-094		Panel

ADD:

1	024-1140-034		Transformer
1	029-1511-036		Rear Screen
1	018-1102-105		Panel W/ 029-1511-043 Overseas Artwork
1	013-1031-005		F-SB-.7/250v
1	023-1135-004		SS-22-0
1	WH18-8 @ 2"		Heavy Hook-up Wire-Grey

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